Glacier Motion by Radar Interferometry

Richard Goldstein
Mail stop 300-227
Jet Propulsion Laboratory
California Institute of Technology
4800 Oak Grove Dr.
Pasadena, CA 91109, USA

Abstract

In its recent radar imaging mission, the Shuttle Imaging Radar satellite devoted three days to repeat-track interferometry. The Shuttle navigation turned to be superb, giving many baselines within a few dozen meters.

When an interferogram is made from successive passes, the image phases depend on both the local topography and any motion of the resolution elements that may have occurred between the two visits. When a third pass is added to the data set, a second interferogram can be produced. Under the assumption of constant motion, it is then possible to separate the effects of motion from topography.

In this paper, we present the results of applying three-pass interferometry to determine the motion and topography of a glacier system at north latitude 59.3 degrees, on the British Columbia, Alaskan border.